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STRAWBERRY VARIETIES IN THE UNITED STATES

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WHAT VARIETIES shall I plant? Perhaps no other question is asked so often in correspondence addressed to the United States Department of Agriculture concerning fruit-growing problems. This question must be answered, directly or indirectly, consciously or unconsciously, by some one in connection with the planting of every fruit garden and fruit farm.

The variety problem is a complicated one. Many things must be considered in choosing varieties, including their adaptability to the conditions where they are to be grown, their value for the purpose for which they are to be used, their dessert quality, cooking quality, shipping quality, keeping quality, storage quality (in the case of some fruits), and ripening season, both actual and relative. Where intended for home use the personal likes and dislikes of the grower and his family will also many times be a factor.

This bulletin is intended as an aid to both commercial and amateur strawberry growers in the selection of varieties best suited to their needs and conditions. The information is based largely on the experience of successful growers in practically every important commercial strawberry-producing district throughout the country, but the results of experiment-station tests, the experience of commercial canners and by-product manufacturers, the preferences of amateur fruit gardeners, and the conclusions resulting from wide personal observation have also been used in making up the variety lists which are given for different sections and regions.

Varieties having particular value for different purposes are grouped under appropriate heads.

New varieties are being constantly introduced to the trade. Nearly all of them possess no special value as compared with others already more or less well known to the trade, and most of them soon disappear from the nurserymen's lists or at best remain of only local importance. But from time to time a new variety is introduced which has sufficient value to give it a somewhat permanent place in the strawberry industry, and as its merits become more and more widely known it is planted accordingly. Or, a variety of special merit, long a local favorite, may be brought to the attention of growers in other districts and rapidly attain a position of commanding importance in the industry.

For these reasons no list of varieties recommended for planting in any section can be regarded as permanent; it is subject to change as valuable new introductions or little-known varieties of value come into prominence and their merits and range of adaptability become known.

Contribution from the Bureau of Plant Industry

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STRAWBERRY VARIETIES IN THE UNITED STATES.

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TESTING VARIETIES.

THE TESTING of varieties of strawberries has long been carried on by private individuals, nurserymen, and experiment stations. Where such tests have been made on soils and under conditions typical of considerable areas they have been valuable. To be of greatest value, however, the tests must be continued for several years, because conditions vary from season to season and the strawberry responds quickly to changes in weather and soil. The varieties selected for extensive commercial growing should be those which, after several years' trial, show the best average record for productiveness and ability to stand shipment and possess other characteristics of commercial importance.

The recommendations made in this bulletin are based upon the experience of strawberry growers, nurserymen, and experiment-station workers throughout the country. Observations have also been made in important representative strawberry-growing regions and on breeding grounds and test plats at the time the berries were ripening,

and the condition of the fruit on arrival in the large markets has been studied.

EXTENSION OF STRAWBERRY GROWING.

From the beginning of commercial strawberry growing, about 1800, until about 1860, the Large Early Scarlet¹ was the leading variety grown in the United States. This variety was derived from the native wild strawberry of the eastern United States, and although of excellent quality, the fruit was too soft to ship to distant markets. Consequently, commercial strawberry growing was limited to the vicinity of a few of the larger cities.

About 1860 the Wilson, which was originated in 1851 and was introduced in 1854, began to replace the Large Early Scarlet, being larger, firmer, and more productive than that variety. Because it was so much firmer it could be shipped to distant markets, and strawberry growing became more general throughout the thickly settled parts of the country. From 1860 until about 1885 the Wilson was the principal variety. Until within a very few years it was grown rather extensively in some parts of western New York for canning, but because of decreasing yields it is not very extensively grown there at the present time. It is still grown, however, in some parts of the Northwest, particularly about Salem, Oreg., where it is the principal variety used for commercial canning.

From about 1880, varieties began to replace each other in more rapid succession. The Crescent, which originated in 1870 and was introduced in 1876, was planted to a considerable extent instead of the Wilson, and was the leading sort in most of the Northern States until after the introduction of the Warfield in 1885. From 1890 to 1900 the Warfield was perhaps the most prominent variety in the North, and the Wilson, Sharpless, and others were used to pollinate it, as, like the Crescent, it is a pistillate variety.

VARIETIES IN THE SOUTH.

In different parts of the Southern States the Crescent and Wilson were important commercial varieties for a considerable period of years prior to about 1890. The Neunan, introduced about 1868, began to replace these sorts to some extent about 1870, however, and from 1880 to 1900 it was a prominent commercial variety in many parts of the South. It is still grown to a small extent in Texas. Between 1890 and 1900 the Cloud was much grown in the Gulf States, being planted commonly with the Neunan as a pollinizer. However, from about 1890 to 1905 the Hoffman, which originated in

¹ Fletcher, S. W. *Fragaria virginiana* in the evolution of the garden strawberry of North America. In *Proc. Soc. Hort. Sci.*, 1915, p. 126. 1916.

the spring of 1877 from a seed of the Neunan,¹ was the most important variety in many of the strawberry-growing districts of the South Atlantic and Gulf States. As early as 1880 the originator¹ sold plants of it widely to growers both North and South, and before 1891 it had practically superseded all other varieties in the Norfolk (Va.) district. The Thompson (*Lady Thompson*), which originated prior to 1891, came into prominence soon after being introduced and was much planted in place of the earlier introductions; from about 1898 it was perhaps the leading commercial sort in the South until the Klondike and Missionary became well known. These two varieties for several years past have been planted in the South for shipment almost to the exclusion of all others.

VARIETIES IN DIFFERENT REGIONS.

Since 1900 many varieties especially adapted to conditions in various parts of the country have been introduced. Thus, the Missionary has become the leading sort in central Florida and the Klondike in most other parts of the South; the Aroma in most of the milder regions of the Central States from southern Indiana, Illinois, and Missouri, south to Tennessee and Arkansas; the Dunlap in all of the Middle West north of the Aroma section; the Jucunda in western Colorado; the Clark, Marshall, Oregon, and Klondike in most parts of the Pacific Coast States; and the Gandy in the States north of the Ohio and Potomac Rivers and east of the Mississippi.

VARIETIES IN NORTHEASTERN STATES.

Aside from the nine varieties named above, few are grown extensively except in the Northeastern States. In that section, however, other sorts are widely grown, including the Chesapeake, Joe, Sample, Parsons, Late Stevens, Belt (*William Belt*), Glen Mary, Williams, Chipman, Bubach, and Pocomoke. Where irrigation is used in the Northeastern States, the Chesapeake is the principal variety planted.

EXTENSION SOUTHWARD.

Strawberries were introduced early and grown commercially in Florida, Louisiana, and Texas south of the regions where the wild strawberry is found. The industry in the Southern States, however, has developed most rapidly since the introduction of varieties which have originated in that section. The Neunan, originating at Charleston, S. C.; the Hoffman, originating near the same city; the Cloud, near Independence, La.; and the Thompson, at Mount Olive, N. C., all gave impetus to the industry. The greatest development, how-

¹ Letter from H. Hoffman, dated June 28, 1892.

ever, has occurred since the introduction in 1901 of the Klondike, a variety originating near Hammond, La., and followed later by the introduction of the Missionary in 1906, some six years subsequent to its origin in Norfolk County, Va.

It is possible to grow the Klondike successfully in the extreme South because of three characteristics: It makes a quick growth of plant and berry in early spring, so that the fruit matures before the extremely hot weather; the berries are firm enough to hold up several days during shipment to northern markets; and the variety is exceptionally resistant to diseases that are common in southern regions.

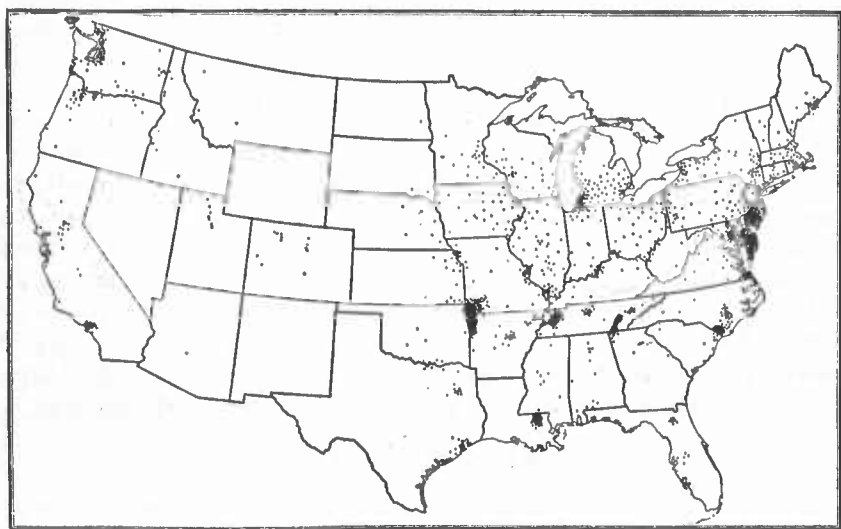


FIG. 1.—Outline map of the United States, showing the strawberry acreage in 1909. Each dot represents 100 acres. (Based on the Thirteenth Census.)

The extent of the strawberry industry in the United States is shown in figures 1 and 2. The map, figure 1, is based on the census statistics of 1909, and includes the total acreage for home and local markets as well as for shipment to general markets. The map, figure 2, is based on commercial shipments for the years 1914¹ and 1915,² and shows the average number of cars shipped in those two seasons; also the large centers of commercial production.

EXTENSION NORTHWARD IN THE CENTRAL STATES.

Until the Dunlap, which originated at Urbana, Ill., was introduced in 1900, the growing of strawberries in much of the northern

¹ Sherman, W. A., Walker, H. F., and Schleussner, O. W. Strawberry supply and distribution in 1914. U. S. Dept. Agr. Bul. 237, 10 p., map. 1915.

² Schleussner, O. W., and Gilbert, J. C. Marketing and distribution of strawberries in 1915. U. S. Dept. Agr. Bul. 477, 32 p., figs. 1-12C. 1917.

Mississippi Valley was difficult and too uncertain to be profitable. Now, however, strawberries are grown in home gardens in nearly all this region and for market throughout a large part of it. The Dmnap, which is the leading variety grown in the North-Central States, is very hardy and productive and in all Northern States quite resistant to disease.

EXTENSION OF THE RIPENING SEASON.

Wild strawberries do not often supply ripe berries for more than three weeks, and until the Wilson was introduced, this was the usual length of time that fruit could be obtained in any one market. This



FIG. 2.—Outline map of the United States, showing the location of the principal commercial strawberry-producing sections and the periods of ripening in each. Each dot represents five cars of fruit, except in districts where the shipment was less than five cars, the number indicated being the average shipments for 1914 and 1915.

variety made it possible to ship berries from southern regions to the northern markets, and with the introduction of still firmer sorts it became possible to obtain strawberries in the larger markets from early in the winter, when berries are shipped from Florida, until July, when berries ripen in the extreme North.

Since the introduction of the Superb in 1911 and the Progressive in 1912 it has been possible to obtain locally grown berries in most northern markets continuously from July to October. These varieties continue to blossom and produce fruit under favorable conditions throughout the growing season. Both are exceptionally hardy and resistant to disease.

SEX OF STRAWBERRIES.

Strawberries produce two types of flowers, imperfect, or pistillate, and perfect, or staminate. Imperfect, or pistillate, flowers contain pistils, but not stamens, while perfect, or staminate, flowers contain both pistils and stamens. Pollen, which is produced in the stamens, is essential to the setting of fruit. A variety with perfect flowers, therefore, can produce fruit when planted by itself, but one with imperfect flowers can not set fruit unless perfect-flowering plants are near by to furnish pollen through the agency of bees or other insects. Because of this, varieties having imperfect flowers are not as desirable as those having perfect flowers, and fewer of them are grown. However, some of the sorts having imperfect flowers, or "imperfect

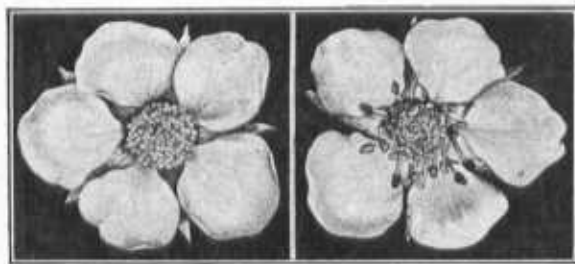


FIG. 3.—Staminate and pistillate flowers of the strawberry.

At the left is a perfect or staminate flower, having both stamens and pistils. At the right is an imperfect flower, having pistils but no stamens. Plants of varieties having imperfect flowers must have plants of perfect-flowered sorts growing near by in order to produce fruit, while the plants of a variety having perfect flowers will produce fruit even though no other sort is near.

varieties" as they are commonly called, are very productive and are liked in certain sections. Imperfect varieties, also, are injured less by the strawberry weevil than perfect sorts, since this insect feeds on pollen; and, in regions where it is serious, imperfect sorts are often grown in relatively large proportions. However, they form less than 5 per cent of the total acreage devoted to strawberries in the United States, and their planting appears to be decreasing.

Where imperfect varieties are used the usual practice in planting is to set one row of a perfect variety for every two or three rows of an imperfect one. Figure 3 shows both types of flowers.

Certain sorts, the Glen Mary, for example, under ordinary conditions produce flowers having both stamens and pistils, but frequently, under peculiar weather conditions, they produce so few stamens that they do not have sufficient pollen to insure the setting of fruit. A variety producing an abundance of pollen should be planted with such sorts in the proportion that perfect varieties are usually planted with imperfect ones.

ADAPTATION OF STRAWBERRY VARIETIES.

In the United States about 50 varieties of strawberries are grown rather extensively. Many of these will doubtless be discarded upon

further trial or when others of better quality and better adapted to particular conditions or uses have been introduced. Many of them are suitable for very restricted sections of the country and for particular conditions and uses in those sections. Others are more widely adapted and may be used for many purposes.

In addition to these 50 sorts several hundred others are raised to a slight extent, but most of them are inferior in productiveness, firmness, or some other characteristic of commercial importance.

ADAPTATION TO CLIMATE.

In the selection of a variety for a given locality one should first determine whether it is suited to its climate. Thus, the *Missionary*, which is a good shipping variety in central Florida, is not a good shipping variety in the upper Mississippi Valley. In the Southern States the *Missionary* and *Klondike* make a quick growth in early spring, producing large crops of early berries, and in those parts of the South suited to them they are excellent shipping sorts. Neither of them, however, is adapted to the climatic conditions found in the Northern States. In like manner, the *Dunlap*, a leading northern sort, is not adapted to southern conditions; when grown there it is too soft for shipping and sometimes too soft even for local markets.

Other varieties, such as the *Glen Mary*, *Belt* (*William Belt*), and *Marshall*, which are grown to a considerable extent in the North-eastern States, are not adapted to conditions farther south because of their greater susceptibility to leaf-spot diseases. The *Clark*, *Jucunda*, and other varieties grown in the dry atmosphere of the irrigated sections of the West are not grown in the East, and whether they would do well under the humid conditions in eastern sections is perhaps doubtful. It is important, therefore, to know the climatic adaptations of the different varieties before selecting them for extensive planting.

ADAPTATION TO SOIL.

The soil requirements of the different varieties are important, though to a less degree than the climatic requirements. Certain varieties, like the *Klondike* and *Dunlap*, are adapted to a very wide range of soils, while others, such as the *Aroma* and *Gandy*, are much more exacting. The *Aroma* seems best adapted to a fairly heavy soil, such as a heavy silt loam, while the *Gandy* does best on a clay loam. The reason for these differences in soil adaption seems to lie, in part at least, in the amount of moisture which the different sorts can get from the different soils through their roots. The root systems of different varieties, as shown in figure 4, differ greatly. By a careful study of soil types and the behavior of different varieties when grown

in them, it is possible to select sorts adapted to most farm lands. Wherever the soil adaptations of the varieties are known they are included in the characterizations given on pages 27 to 36.

ADAPTATION TO SPECIAL CONDITIONS.

Besides the varieties adapted to certain climatic and soil conditions there are others which are suited to certain special conditions, such as irrigation and intensive garden culture. Thus, the Chesa-



FIG. 4.—Bundles of strawberry plants of the Dunlap and Chesapeake varieties, showing the differences in the root systems of these varieties.

apeake is the variety best liked by those growing strawberries under irrigation in the Northeast. This variety, which often fails to make a sufficient number of plants to produce profitable crops under non-irrigated conditions, makes an excellent stand and gives very large yields when irrigated. Likewise, the Marshall, Glen Mary, and some others, which do not yield satisfactorily under ordinary field treatment, produce very large crops when grown under intensive garden culture and when stable manure is applied.

Varieties which fruit well in certain localities may, nevertheless, be undesirable in those same locations. Thus, many sorts will produce good crops in the South, but because they ripen after the fruit grown farther north is supplying the markets, they are unprofitable from the standpoint of the commercial grower. The more southern growers can not compete with those located much nearer the northern markets, to which the fruit is largely shipped. The sequence of the shipping period in the different districts is shown in figure 2. Berries in Florida ripen during the winter, while farther north the ripening follows in succession. Each grower, therefore, must select varieties which ripen in his locality at a time when the markets to which he ships are not fully supplied from other districts more favorably located than his for supplying the demand.

Those raising berries for the home table and local market should plant a variety which ripens through a long season, or several sorts ripening in succession. In the vicinity of Washington, D. C., for instance, two varieties are commonly grown to supply the local market. The Tennessee is the leading early sort in that locality, and it is followed by the Gandy as the leading late-ripening sort.

Varieties especially adapted to canning and preserving are grown in many localities. Those growing berries for such a trade should plant sorts which are very productive, hull easily, and retain their form, color, and flavor when canned. The Wilson, Clark, Parsons, and others are used for such purposes in the regions where they are grown.

DISTRIBUTION OF VARIETIES.

For the purpose of obtaining information on the varieties best adapted to different regions, a large number of commercial growers in the important producing districts in all parts of the United States were requested during 1916 to give the names of the leading sorts in their localities, together with information concerning the acreage, relative importance, and merits of each variety as grown under their conditions. In addition, personal visits were made to nearly all important commercial regions, and most of the State agricultural experiment stations assisted in furnishing information on strawberry varieties. The lists given in Table I have been compiled from information thus obtained.

HOW TO USE THE LIST OF VARIETIES.

The lists in Table I are arranged alphabetically by States and, under the States, by the districts in which strawberries are grown commercially, if such districts exist. The varieties are placed ap-

proximately in the order of their commercial importance in the different districts, and in the column headed "Season and use" the purpose for which each variety is especially adapted is given where particular merit is known to exist. In using the lists, the following points should be kept in mind:

(1) The variety lists are suggestive only. Under certain local conditions other sorts may be fully as desirable as those named.

(2) In the Northeastern States, strawberry varieties are very exacting in their climatic and soil requirements. Therefore, several varieties having the same season of ripening are named in many instances. One's choice of varieties under these conditions should be guided by the experience of neighbors, so far as it can be used.

(3) The listing of varieties for certain districts and for certain States should not be construed as evidence that conditions therein are necessarily favorable to the development of a commercial strawberry industry. On the other hand, many sections not named in the lists are well adapted to strawberry growing, those mentioned being simply those in which the principal development has taken place.

(4) The fact that a variety is adapted to a certain purpose in one region is not necessarily evidence that it will be adapted to a similar purpose in another region.

(5) In some localities the sequence of ripening is of great importance. The relative time of ripening given in this list is, however, only approximate. Conditions within a given region vary widely, and the time of ripening will be largely dependent upon local conditions. Varieties for a particular district should be selected so that they will ripen at a time when the markets in which they are to be sold are not fully supplied from other districts more favorably located; otherwise, an unequal competition is inevitable at times.

(6) With the increase of interest in strawberry breeding and increased knowledge of the work, better sorts are continually being originated. New varieties worthy to replace some of the standard sorts of the present time have already been produced and may be expected to come into prominence gradually. It is probable that still better varieties will be developed in the future.

(7) In selecting varieties for a place not specified in the lists, one should choose sorts grown where the conditions are as nearly as possible like those of the place in question.

(8) The lists should be used in connection with the characterizations of varieties given on pages 27 to 36.

LIST OF VARIETIES.

TABLE I.—*Lists of strawberry varieties arranged by States and sections.*

[Names of imperfect varieties are followed by the abbreviation "*imp.*" The lists show the varieties most commonly grown in the various regions. Those recommended for commercial planting are marked with an asterisk (*). Under "Season and use" the terms early, everbearer, medium late, midseason, late, short, throughout summer, etc., relate to the season of fruitage; the terms canning, dessert, general use, home use, main crop, market, shipping, etc., show the purpose for which the variety is grown.]

State, section, locality, and variety.	Season and use.	State, section, locality, and variety.	Season and use.
ALABAMA.		COLORADO.	
Castleberry:		Loveland-Denver:	
*Klondike.....		*Dunlap.....	Early.
Cullman:		*Jucunda.....	Late.
*Aroma.....	Late.	Steamboat Springs:	
Klondike.....	Early.	*Jucunda.....	Do.
Thorsby:		Throughout the State:	
*Klondike.....		*Dunlap.....	Early.
York:		*Jucunda.....	Late.
*Klondike.....			
Throughout the State:		CONNECTICUT.	
South of Cullman—		New Haven:	
*Klondike.....		*Glen Mary.....	Midseason.
North of Cullman—		*Late Stevens.....	Late.
*Aroma.....	Late.	*Chesapeake.....	Do.
Klondike.....	Early.	*Gandy.....	Do.
ARKANSAS.		Throughout the State:	
Horatio:		*Sample.....	Do.
*Klondike.....		*Dunlap.....	Midseason.
Judsonia:		*Glen Mary.....	Do.
*Aroma.....	Late.	*Late Stevens.....	Late.
*Klondike.....	Early.	*Chesapeake.....	Do.
Ozark region:		*Gandy.....	Do.
*Aroma.....	Late.	Progressive.....	Everbearer.
*Klondike.....	Early.		
Throughout the State:		DELAWARE.	
North of Judsonia—		Bridgeville:	
*Aroma.....	Late.	*Gandy.....	Late.
Klondike.....	Early.	*Myer (<i>imp.</i>).....	Midseason.
South of Judsonia—		*Woolverton.....	Pollinizer for Myer.
*Klondike.....		*Joe.....	Late.
ARIZONA.		Superior.....	Early.
Throughout the State:		Aroma.....	Should be further tested.
*Arizona.....		Chesapeake.....	
*Klondike.....		Selbyville:	
St. Louis.....		*Gandy.....	Late.
CALIFORNIA.		*Klondike.....	Canning and early market.
Fresno:		*Parsons.....	Canning.
*Marshall.....	Throughout summer.	*Chesapeake.....	Late.
Brandywine.....	Do.	*Joe.....	Do.
Los Angeles:		Throughout the State:	
*Brandywine.....	Do.	*Joe.....	Do.
*Klondike.....	Spring crop only.	*Gandy.....	Do.
Excelsior.....		Superior.....	Early.
Nich Ohmer.....		Parsons.....	Canning.
Sacramento:		*Klondike.....	Canning and early market.
*Dollar.....	Best shipping and late sort.	Chesapeake.....	Late.
Jessie.....	Early.	*Myer (<i>imp.</i>).....	Midseason.
*Marshall.....	Replacing Jessie.	*Woolverton.....	Pollinizer for Myer.
San Francisco:		DISTRICT OF COLUMBIA.	
*Marshall.....		Washington:	
*Oregon.....		*Tennessee.....	Early.
*Nich Ohmer.....		*Gandy.....	Late.
Melinda.....		*Chesapeake.....	Do.
Throughout the State:		FLORIDA.	
North of Fresno—		Plant City-Lakeland:	
*Marshall.....		*Missionary.....	Practically no other planted.
*Oregon.....		Starke-Lawtey:	
*Dollar.....		*Klondike.....	Do.
*Nich Ohmer.....			
Longworth.....	Light yielder.		
South of Fresno—			
*Brandywine.....	Dessert.		
*Klondike.....	Shipping.		

TABLE I.—*Lists of strawberry varieties arranged by States, etc.*—Continued.

State, section, locality, and variety.	Season and use.	State, section, locality, and variety.	Season and use.
GEORGIA.		KANSAS—continued.	
Rossville:		Throughout the State:	
*Aroma.....	Late.	*Dunlap.....	Hardest sort.
Klondike.....	Early.	*Aroma.....	Shipping.
Menlo:		*Progressivo.....	Everbearer.
*Aroma.....		Gandy.....	Late.
Throughout the State:		Warfield (<i>imp</i>).....	
North of Atlanta—		Paul Jones (<i>imp</i>).....	
*Aroma.....	Late.		
*Klondike.....	Early.		
South of Atlanta—			
*Klondike.....			
IDAHO.		KENTUCKY.	
Throughout the State:		Bowling Green:	
*Superb.....	Everbearer.	*Aroma.....	
Progressive.....	Do.	Louisville:	
Clark.....	Shipping.	*Aroma.....	
*Glen Mary.....	Local market.	Gandy.....	
Brandywine.....	Do.	Throughout the State:	
Bolt (<i>William Belt</i>).....	Do.	*Aroma.....	Medium late.
Marshall.....	Do.	Gandy.....	Late.
ILLINOIS.		LOUISIANA.	
Anna:		Throughout the State:	
*Gandy.....	Late.	*Klondike.....	
Klondike.....	Early.		
*Aroma.....	Medium late.		
Throughout the State:			
Northern district—			
*Dunlap.....	Best variety.		
Sample (<i>imp</i>).....			
Warfield (<i>imp</i>).....			
Aroma.....			
Glen Mary.....			
Progressive.....	Everbearer.		
Southern district—			
Dunlap.....			
*Gandy.....	Late.		
*Aroma.....	Medium late.		
Klondike.....			
Haverland (<i>imp</i>).....			
INDIANA.		MAINE.	
New Albany:		Throughout the State:	
*Aroma.....		*Dunlap.....	Midseason.
Gandy.....		*Sample (<i>imp</i>).....	Late.
Throughout the State:		*Marshall.....	Special markets.
*Dunlap.....	Local market.	*Glen Mary.....	Midseason.
*Aroma.....	Shipping.	*Progressive.....	Everbearer.
*Gandy.....	Late.	Belt (<i>William Belt</i>).....	
*Sample (<i>imp</i>).....	Do.		
*Glen Mary.....	Midseason.		
Belt (<i>William Belt</i>).....			
Bubach (<i>imp</i>).....			
Haverland (<i>imp</i>).....			
Chesapeake.....			
Progressive.....	Everbearer.		
IOWA.		MARYLAND.	
Keokuk:		Berlin:	
*Dunlap.....		*Klondike.....	Canning and early market.
Warfield (<i>imp</i>).....		*Gandy.....	Late.
Throughout the State:		*Joe.....	Do.
*Dunlap.....	Leading sort.	*Chesapeake.....	Do.
Warfield (<i>imp</i>).....		Parsons.....	Canning.
*Progressive.....	Everbearer.		
KANSAS.		Marion:	
Wathena:		*Missionary.....	Early.
Dunlap.....		*Gandy.....	Late.
Sample (<i>imp</i>).....		*Joe.....	Do.
*Aroma.....	Best shipping.	*Chesapeake.....	Do.
Paul Jones (<i>imp</i>).....			
Warfield (<i>imp</i>).....			
Gandy.....			
		Pittsview:	
		*Gandy.....	Do.
		*Chesapeake.....	Do.
		*Joe.....	Do.
		*Parsons.....	Canning.
		Klondike.....	Early market and canning.
		Ridgley:	
		Superior.....	Canning.
		*Gandy.....	Late.
		Parsons.....	Canning.
		Tennessee.....	
		Salisbury:	
		*Gandy.....	Late.
		*Chesapeake.....	Do.
		*Joe.....	Do.
		*Klondike.....	Early.
		Showell:	
		*Gandy.....	Late.
		*Klondike.....	Early.
		MASSACHUSETTS.	
		Concord:	
		*Glen Mary.....	Midseason.
		*Marshall.....	Special market.
		*Chesapeake.....	Late.
		Falmouth:	
		*Echo.....	
		Marshfield Hills:	
		*Marshall.....	

TABLE I.—*Lists of strawberry varieties arranged by States, etc.*—Continued.

State, section, locality, and variety.	Season and use.	State, section, locality, and variety.	Season and use.
MASSACHUSETTS—contd.		NEBRASKA.	
New Bedford:		Throughout the State:	
*Minute Man (<i>imp</i>).....		*Dunlap.....	
Worcester:		*Warfield (<i>imp</i>).....	
*Kittie Rice (<i>imp</i>).....	Known as <i>Downing's Bride</i> .	Bederwood.....	Everbearer.
Throughout the State:		*Progressive.....	
*Dunlap.....	Midseason.	NEVADA.	
*Sample (<i>imp</i>).....	Late.	[Varieties grown in Utah and California should be tried.]	
*Glen Mary.....	Midseason.	NEW HAMPSHIRE.	
*Marshall.....	Special market.	Throughout the State:	
Abington.....		*Dunlap.....	Midseason.
Minute Man (<i>imp</i>).....		*Sample (<i>imp</i>).....	Late.
Parsons.....		*Glen Mary.....	Midseason.
Belt (<i>William Belt</i>).....		*Marshall.....	Special market.
Chesapeake.....		Bubach (<i>imp</i>).....	
Brandywine.....		Brandywine.....	
Echo.....		Chesapeake.....	
*Progressive.....	Everbearer.	Progressive.....	Everbearer.
MICHIGAN.		NEW JERSEY.	
Benton Harbor—St. Joseph:		Southern district:	
*Dunlap.....		*Gandy.....	Late.
Brandywine.....		*Chesapeake.....	Irrigated fields.
*Pocomoke (<i>Gibson</i>).....		*Joe.....	Late.
Chesapeake.....		Campbell.....	Early.
Bridgman:		Success.....	
*Dunlap.....	Midseason.	Late Stevens.....	
*Pocomoke.....	Do.	Superior.....	
*Sample (<i>imp</i>).....	Late.	Shropshire.....	
*Aroma.....	Do.	Lupton.....	
Fennville:		Northern district:	
Brandywine.....		*Chesapeake.....	Late; irrigated fields.
Dunlap.....		*Joe.....	Late.
Pocomoke.....		Campbell.....	Early.
Throughout the State:		*Gandy.....	Late.
*Dunlap.....	Midseason.	*Marshall.....	Special market.
*Pocomoke.....	Do.	*Glen Mary.....	Midseason.
*Sample (<i>imp</i>).....	Late.	*Success.....	Early.
*Gandy.....	Do.	NEW MEXICO.	
*Glen Mary.....	Midseason.	Throughout the State:	
*Progressive.....	Everbearer.	Dunlap.....	
Joe.....	Trial for late.	Arizona.....	
MINNESOTA.		*Klondike.....	
Throughout the State:		NEW YORK.	
*Dunlap.....		Oswego:	
*Warfield (<i>imp</i>).....		*Late Stevens.....	
*Progressive.....	Everbearer.	Dunlap.....	
Bederwood.....		Glen Mary.....	
MISSISSIPPI.		Rochester:	
Throughout the State:		*Glen Mary.....	Midseason.
Klondike.....		Brandywine.....	
MISSOURI.		*Sample (<i>imp</i>).....	Late.
Ozark section:		Wilson.....	(¹)
*Aroma.....	Late.	Erle and Chautauqua Counties:	
Klondike.....	Early.	*Glen Mary.....	
North of Missouri River:		Belt (<i>William Belt</i>).....	
*Dunlap.....		*Williams.....	
Warfield (<i>imp</i>).....		Dunlap.....	
*Progressive.....	Everbearer.	*Sample.....	
South of Missouri River:		*Pocomoke.....	
*Dunlap.....		*Parsons.....	Canning.
*Aroma.....	Home use.	Bederwood.....	
Bubach (<i>imp</i>).....	Shipping.	Highland and Milton:	
*Gandy.....	Late.	Belt (<i>William Belt</i>).....	
Sample (<i>imp</i>).....		Bubach (<i>imp</i>).....	
MONTANA.		Gandy.....	
Throughout the State:		Chesapeake.....	
*Dunlap.....			

¹ Formerly much planted for canning; now not extensively grown.

TABLE I.—*Lists of strawberry varieties arranged by States, etc.*—Continued.

State, section, locality, and variety.	Season and use.	State, section, locality, and variety.	Season and use.
NEW YORK—continued.		PENNSYLVANIA.	
Highland and Milton—Con.		North East:	
Joe.....		Williams.....	
Glen Mary.....		Sample (<i>imp</i>).....	
Sample (<i>imp</i>).....		Pocomoke.....	
Throughout the State:		Throughout the State:	
*Dunlap.....	Midseason.	*Gandy.....	Late.
*Glen Mary.....	Do.	*Dunlap.....	Midseason.
*Sample (<i>imp</i>).....	Late.	Belt (<i>William Belt</i>).....	
Belt (<i>William Belt</i>).....		*Sample (<i>imp</i>).....	Late.
*Marshall.....	Special market.	Aroma.....	
New York.....		Late Stevens.....	
*Gandy.....	Late.	Joe.....	
*Late Stevens.....	Do.	Chesapeake.....	
Brandywine.....		Williams.....	
Chesapeake.....		Pocomoke.....	
Columbia (<i>imp</i>).....			
Progressive.....	Everbearer.		
NORTH CAROLINA.		RHODE ISLAND.	
Chadbourn:		Throughout the State:	
*Klondike.....		*Marshall.....	Special market.
Mount Olive:		*Dunlap.....	Midseason.
*Klondike.....		*Sample (<i>imp</i>).....	Late.
Missionary.....		Progressive.....	Everbearer.
Throughout the State:			
*Klondike.....		SOUTH CAROLINA.	
Missionary.....		Throughout the State:	
Thompson.....		*Klondike.....	
		Missionary.....	
		Thompson.....	
NORTH DAKOTA.		SOUTH DAKOTA.	
Throughout the State:		Throughout the State:	
*Dunlap.....		*Dunlap.....	
*Progressive.....	Everbearer.	*Warfield (<i>imp</i>).....	
		*Progressive.....	Everbearer.
OHIO.		Boderwood.....	
Southern district:		Sample (<i>imp</i>).....	
*Aroma.....	Medium late.		
*Gandy.....	Late.	TENNESSEE.	
Northern district:		Knoxville:	
*Dunlap.....	Midseason.	*Aroma.....	
Gandy.....	Late.	Klondike.....	
*Sample (<i>imp</i>).....	Do.	Chattanooga:	
*Bubach (<i>imp</i>).....	Midseason.	Klondike.....	Early.
Haverland (<i>imp</i>).....	Do.	*Aroma.....	Late.
Warfield (<i>imp</i>).....		Dyer:	
Parsons.....		*Klondike.....	Early.
Chesapeake.....		*Gandy.....	Late.
New York.....		Humboldt:	
Belt (<i>William Belt</i>).....		*Klondike.....	
Progressive.....	Everbearer.	Nashville:	
		*Aroma.....	Medium late.
OKLAHOMA.		*Gandy.....	Late.
Throughout the State:		Champ Clark.....	Local market.
*Klondike.....			
Aroma.....		TEXAS.	
Dunlap.....		Carrizo Springs:	
Sample (<i>imp</i>).....		*Klondike.....	
OREGON.		Houston:	
Hood River:		*Klondike.....	Main crop.
*Clark.....		Excelsior.....	Very early.
Throughout the State:		Tyler:	
*Gold Dollar.....	Early local market.	*Klondike.....	
*Magoon.....	Midseason local market.		
		UTAH.	
*Marshall.....	Do.	Throughout the State:	
*Clark.....	Canning and ship-	Jucunda.....	
	ping.	Chesapeake.....	
*Wilson.....	On rich soils; can-	Marshall.....	
	ning.	Gandy.....	
*Oregon.....	Local market and		
	home use; long	VERMONT.	
Superb.....	fruiting.	Throughout the State:	
	Everbearer.	*Dunlap.....	Midseason.

TABLE I.—*Lists of strawberry varieties arranged by States, etc.*—Continued.

State, section, locality, and variety.	Season and use.	State, section, locality, and variety.	Season and use.
VERMONT—continued.		WASHINGTON—continued.	
Throughout the State—Con.		Puget Sound region:	
*Warfield (<i>imp</i>).....	Late. Midseason.	*Marshall.....	General use. Shipping and can- ning.
*Sample (<i>imp</i>).....		*Clark.....	
*Glen Mary.....		Magoon.....	Canning.
*Belt (<i>William Belt</i>).....		Gold Dollar.....	
Marshall.....		Oregon.....	
Abington.....		*Wilson.....	
Joe.....			
Chesapeake.....	Everbearer.	WEST VIRGINIA.	
*Progressive.....		Throughout the State:	
VIRGINIA.		*Aroma.....	
Crozet:		*Gandy.....	
Gandy.....		Dunlap.....	
Aroma.....		Haverland (<i>imp</i>).....	
Norfolk:		WISCONSIN.	
*Klondike.....		Throughout the State:	
Missionary.....		*Dunlap.....	
Jamestown.....		*Warfield (<i>imp</i>).....	
Eastern Shore counties:	Early; short.	Bederwood.....	
*Chipman.....		*Progressive.....	Everbearer.
Klondike.....			
James.....			
Heflin.....		WYOMING.	
WASHINGTON.		Throughout the State:	
White Salmon:		*Dunlap.....	
Clark.....		Bederwood.....	

It will be noted from Table I that only a comparatively small number of varieties are grown extensively in this country, while in some States only one sort is grown to any extent. Many varieties listed, although important in some locality, are comparatively unimportant when the industry as a whole is considered. Such varieties do not usually remain in cultivation long, for nurserymen do not find them as profitable to propagate as the widely grown sorts. Furthermore, local varieties are not known by the trade as well as the standard sorts and the fruit is not wanted by buyers unless of exceptionally good quality and grade. Therefore, under ordinary conditions, growers shipping to the general markets should raise only well-known varieties.

IMPORTANCE OF THE VARIETIES.

In Table II the varieties are listed in the order of their importance in the country at the present time on the basis of the acreage planted to each. The table gives the approximate percentage of the total acreage in the country devoted to each variety. The information on which the table is based was obtained in 1916 in connection with that presented in Table I.

It should be noted that 25 sorts constituted about 90 per cent of the total commercial strawberry acreage in the United States in 1916.

The first two sorts, Klondike and Aroma, constituted 41 per cent of the acreage. Both have exceptionally healthy foliage, and both produce berries which are firm enough to be shipped to distant markets.

Nine varieties in Table II are known to have originated as the result of definite work for the production of better varieties. These constituted 59.5 per cent of the total acreage in strawberries in the United States in 1916. Three of the varieties together—Klondike, Aroma, and Dunlap—constituted 51 per cent of the acreage.

As indicated in the last item in Table II, "other varieties" make up 10 per cent of the total acreage devoted to strawberries. This 10

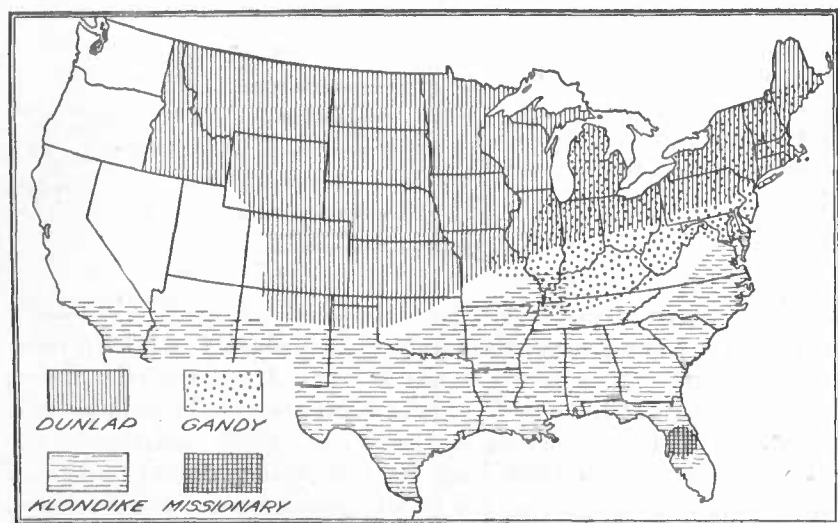


FIG. 5.—Outline map of the United States, showing where the Dunlap, Klondike, Gandy, and Missionary varieties of strawberries are profitably grown. The Missionary variety is grown in sections other than those shown, but is recommended only for the area indicated.

per cent of the total is composed principally of 26 varieties which are given in the relative order of their importance on an acreage basis as follows: Excelsior, Haverland, Campbell, Myer, Superior, Shropshire, Success, Echo, Williams, Jessie, Thompson, Abington, Magoon, Kittie Rice (*Downing's Bride*), Bederwood, Tennessee, Woolverton, Gold Dollar, Minute Man, New York, Superb, Mascot (*Doris*), Early Hathaway (*Texas*), Columbia, Lupton, Arizona. While there are many other varieties in the trade they are grown to such a limited extent as to be practically negligible as varieties from a commercial standpoint.

TABLE II.—*The principal strawberry varieties in the United States in the order of their importance on the basis of acreage.*

Rank.	Variety.	Total acreage (per cent).	Rank.	Variety.	Total acreage (per cent).
1	Klondlko.....	28	15	Wilson.....	1
2	Aroma.....	13	16	Chipman.....	1
3	Dunlap.....	10	17	Warfield.....	1
4	Gandy.....	9	18	Dollar.....	1
5	Missionary.....	4	19	Bubach.....	1
6	Chesapeake.....	3	20	Pocomoke.....	1
7	Clark.....	2.5	21	Oregon.....	1
8	Joe.....	2	22	Jucunda.....	1
9	Marshall.....	2	23	Brandywine.....	.5
10	Sample.....	1.5	24	Nich Ohmer.....	.5
11	Parsons.....	1.5	25	Progressive.....	.5
12	Late Stevens.....	1.5		Other varieties.....	10
13	Belt (<i>William Belt</i>).....	1.5		Total.....	100
14	Glen Mary.....	1			

The maps shown as figures 5 and 6 outline the regions where the Klondike, Aroma, Dunlap, Gandy, and certain other important varieties are principally grown. The regions thus outlined are approximate only, and probably exclude small areas where these varie-



FIG. 6.—Outline map of the United States, showing the areas where the Jucunda, Clark, Marshall, and Aroma varieties of strawberries are grown extensively.

ties are raised. They show, however, the wide distribution of certain varieties, suggesting at the same time that many of them are adapted to wide variations in soil and climate.

VARIETIES FOR SPECIAL PURPOSES.

Not all sorts are equally well suited to all purposes, and growers often use certain ones for special markets. For home gardens sev-

eral sorts may be needed, ripening from early to late. In many localities where large quantities of berries are canned, varieties especially adapted to this purpose are needed.

VARIETIES FOR CANNING AND SODA FOUNTAINS.

Varieties for canning and the soda-fountain trade should be productive and should bear medium-sized firm-fleshed berries, separating readily from the calyx (hull), deep red to the center, and brisk sub-acid to acid in flavor. Berries having a color that does not fade readily when canned make the most attractive product and are the most desirable.

The Wilson is used to some extent for canning and the soda-fountain trade near Rochester, N. Y., and in western Oregon and Washington. In fact, this variety is grown at present only because of its superior canning qualities. Near Rochester, a variety locally called the Money-maker is considered an especially desirable sort for canning and soda-fountain uses. Its origin is unknown, although it resembles the Joe in many ways. In the Hood River and White Salmon regions of Oregon and Washington the Clark is extensively used. About San Francisco, Calif., the Melinda is liked best by the canners. In southern California and nearly all of the southern part of the United States the Klondike is preferred. In many places in Maryland and Delaware the Parsons is liked as well as the Klondike. It is easier to remove the calyx (hull) from the Parsons than from the Klondike, and the former is usually more productive in the States mentioned. The Parsons is also grown for canning in many parts of the Northeast. In the Middle West the Warfield is liked for this purpose.

The seven varieties named above are those considered most desirable by the canning and soda-fountain trade. Other sorts used to a considerable extent for such purposes are the Gandy, Superior, Dunlap, Joe, and Missionary. The Marshall, though of a mild sub-acid flavor, makes a product of very high quality. It is not very productive under ordinary culture in the East and is not often grown there, but it produces well in California and is extensively used for canning and the soda-fountain trade.

VARIETIES FOR SHIPPING.

The following varieties when grown in regions to which they are adapted are among the best for shipping to distant markets: Klondike, Aroma, Clark, Missionary, Gandy, Chesapeake, Joe, Campbell, Excelsior, and Nich Ohmer. Other sorts which are fairly good shippers, are the Late Stevens, Echo, Dollar, Myer, Sample, Pocomoke, Dunlap, New York, and Jucunda. Although these sorts are firm in

some sections, they may not be and often are not good shipping sorts in other sections. Therefore, a grower who ships to distant markets should select varieties which have proved firm when grown in his locality and should not rely too much on the reported behavior of a variety in some section remote from his own.

VARIETIES FOR SEVERE WINTER CLIMATES.

In the upper Mississippi Valley it is essential that very hardy sorts be selected. Lack of moisture, drying winds, and low temperatures in winter combine to make very trying conditions, and only a very few sorts succeed there. Of these, the Progressive, an ever-bearer, is considered the hardiest, the Dunlap next, and the Warfield next. The Bederwood and Superb are also hardy in some parts of this region.

DISEASE RESISTANCE.

The most serious fungous diseases affecting strawberry plants are Botrytis and the various leaf-spots. The Botrytis attacks the stem, calyx (hull), and fruit in various stages of development. In rainy seasons the loss caused by this fungus is often serious, and in sections where such seasons occur frequently during the fruiting period those varieties should be selected which appear from wide observation to be least susceptible. Varieties believed to be more or less resistant are the Sample, Chesapeake, Aroma, and Superb, but under conditions especially favorable for the development of the disease their resistance is sometimes less pronounced.

There is a wide range of variation in the resistance of varieties to leaf-spots, which occur wherever strawberries are grown. In semi-arid regions the leaf-spots do little damage. They often cause serious injury in the North, but are especially destructive in the Southern States. Varieties, such as Glen Mary and Marshall, which are susceptible to these diseases, are limited in their range to semiarid and northern regions. Some sorts, however, show marked resistance, among them the Chesapeake, Progressive, Aroma, Superb, and Dunlap.

In some sections of the United States and in certain seasons considerable damage to the foliage of some varieties is caused by mildew. It is of much less common occurrence, however, than either of the other diseases mentioned and is not of great importance, as a rule, on the more generally grown commercial sorts.

INSECT RESISTANCE.

Less is known of the relative susceptibility of strawberry varieties to the various insect pests than of their susceptibility to diseases of the foliage and fruit. It is known, however, that the Chesapeake is

more resistant than many sorts to attacks of red spider and thrips. Varieties having imperfect flowers are known to be damaged very little by the weevil, while in certain sections those having perfect flowers are often severely injured. Therefore, wherever the weevil does serious damage, growers prefer to plant imperfect varieties, with the perfect varieties least susceptible to injury by the weevil for pollinators. Among the perfect sorts badly injured by the weevil are the Somerset Pride (*Pride of Somerset*), Chipman, Klondike, and Missionary. The Aroma and Mascot have been the least attacked, while the Gandy seems to be less susceptible than many other sorts.

LARGE, SHOWY FRUIT.

Among the varieties having large, showy fruit are the Chesapeake, Columbia, Joe, Nich Ohmer, Lupton, Marshall, Oregon, Magoon, Success, and Belt (*William Belt*). Others bearing fruit which is almost as large and showy as these are New York, Early Jersey, Glen Mary, Aroma, Gandy, Mascot, Brandywine, and Jucunda.

ESPECIALLY SWEET FRUIT.

Many who can not eat certain varieties because of their high acidity can eat the milder flavored sorts without harm. The New York is considered one of the best for such use, as it is very mild. Other mild-flavored sorts are the Marshall, Chesapeake, Belt (*William Belt*), Nich Ohmer, Early Jersey, and Superb.

FRUIT OF ESPECIALLY HIGH DESSERT QUALITY.

The quality of strawberry varieties is influenced to a large extent by climate and local weather conditions. Furthermore, varieties that appeal to certain individuals as of very high quality do not so appeal to others. Some like varieties with a very mild flavor, while others like those having a pronounced flavor and considerable acidity. Varieties vary greatly from season to season in the same section, and often have higher dessert quality toward the end of the season than at the beginning. Moreover, a variety may have good dessert quality in one locality, but this quality may be poor in a section having a different climate. Thus, the Nich Ohmer is almost insipid in Florida, but often has high quality in New Jersey and very high quality in California.

The Marshall, Americus, and Jucunda are among the varieties having the best dessert quality. The Marshall is mild in flavor; the Americus, an everbearer, is a little more acid and has a musky flavor as well, while the Jucunda is subacid. Other varieties of high quality are the Belt (*William Belt*), Chesapeake, Joe, Dunlap, Oregon,

Brandywine, Success. New York, and in certain sections the Nich Ohmer.

VARIETIES ADAPTED TO HILL CULTURE.

Along the South Atlantic and Gulf coast plants of the Klondike and Missionary are commonly set in late summer or autumn, and do not have an opportunity to make runners before fruiting the following season. They are, therefore, grown in accordance with the hill system. In other parts of the United States east of the Rocky Mountains these sorts are ordinarily grown under the matted-row system.

In the irrigated regions of the West nearly all varieties are grown, to some extent at least, under the hill system. Among these are the Clark, Marshall, Magoon, Superb, Dollar, Jessie, Klondike, Nich Ohmer, Oregon, Brandywine, and Jucunda.

In humid regions, however, few varieties are ordinarily grown in hills. Those so grown are sorts which bear showy fruit of high quality or which make comparatively few runners. The most important of these sorts are the Chesapeake, Marshall, Joe, and Columbia, and among the everbearers the Superb and Progressive.

TABLE III.—*Varieties listed according to season of ripening.*

[Abbreviations: *eb*—Everbearer, *em*—early to midseason, *ml*—midseason to late, *ve*—very early, *vl*—very late.]

Early varieties.	Midseason varieties.		Late varieties.
Bederwood. Campbell (<i>ve</i>). Chipman. Dunlap (<i>em</i>). Early Hathaway (<i>ve</i>). Excelsior (<i>ve</i>). Gold Dollar. Progressive (<i>ve, eb</i>). Superior. Tennessee. Warfield.	Ablington. Arizona. Bubach. Clark. Dollar. Echo. Glen Mary. Haverland (<i>em</i>). Jessie. Kittie Rice (<i>em</i>). Klondike. Magoon. Marshall (<i>em</i>). Minute Man (<i>em</i>).	Missionary (<i>em</i>). Myer (<i>ml</i>). New York. Oregon (<i>em</i>). Parsons. Pocomoke. Shropshire. Superb (<i>eb</i>). Success (<i>em</i>). Thompson (<i>em</i>). Woolverton. Wilson. Williams.	Aroma (<i>ml</i>). Belt (<i>William Belt</i>) (<i>ml</i>). Brandywine. Chesapeake. Columbia. Gandy. Joe (<i>ml</i>). Jucunda. Late Stevens. Mascot (<i>vl</i>). Nich Ohmer (<i>ml</i>). Sample.

EARLY, MIDSEASON, AND LATE VARIETIES.

It is difficult to classify varieties according to their season of ripening, because this period is influenced by local weather conditions, by climate, exposure, soil, and the treatment given the plantation. Thus the Missionary, which is an early variety in Maryland, may begin to bear in Florida in December and continue until May under favorable conditions. The Brandywine and Marshall mature their fruit in June in Massachusetts, but in California they may begin in April and fruit almost continuously until November. Weather con-

ditions also affect the length of the ripening season, and a variety which ordinarily ripens its crop in a short period may, in cool weather, have a season extending over several weeks. Varieties are affected differently by cool weather, some which are early and ripen very rapidly in warm weather may be late and ripen very slowly when the weather is cool. Exposure, type of soil, and cultural conditions also affect the ripening season of varieties. Any classification on the basis of the season of ripening therefore must be somewhat general, and the lists given in Table III must be so interpreted.

EVERBEARING VARIETIES.

In Table III two sorts, the Progressive and Superb, are listed according to the season when they produce their spring crop. Under favorable conditions they also produce a crop during the summer and autumn. Several other everbearing sorts are in the trade, but are not generally as desirable as these. Among those grown to a slight extent are the Peerless, Amerieus, Francis, and Minnesota No. 1017.

NEW VARIETIES.

New sorts which are superior to standard ones are introduced occasionally, but most of the introductions are inferior. The number of new varieties that may be introduced can be better realized by reference to figure 7, which shows beds containing about 15,000 seedlings, each one potentially a distinct variety. The breeder on whose grounds the photograph was taken has raised from 10,000 to 25,000 seedlings annually for many years and is testing hundreds under field conditions, but has not yet introduced a single variety. Other breeders in various parts of the United States are doing similar work. The best of the seedlings are introduced as new varieties, but on extended trial they may develop some weakness which makes them undesirable. Growers, therefore, should test new varieties before planting them extensively.

When new varieties are tested they should be set by the side of standard sorts and receive similar treatment. If a variety shows itself very susceptible to leaf-spot and other diseases it should be discarded after one crop is harvested; if it does not seem susceptible, the test should extend over two or three years, as some seasons are more favorable than others. Furthermore, even in favorable seasons some varieties do not show their true character the first year. A 3-year test, however, will generally indicate the probable value of any new sort.

It is not intended in this bulletin to make recommendations regarding new varieties. They must be tested widely in representative sections in order to determine their range of adaptability and relative merit. Certain sorts, however, have been extensively grown in

restricted areas and have been found very desirable. Some of these might well be tested in other localities. Among them are the Campbell, Joe, and Mascot. The Campbell is an early sort raised extensively in New Jersey. The Joe is a midseason to late sort grown in New Jersey, and extensively also in Delaware and Maryland. It has large, attractive, firm fruit, and is replacing the Chesapeake in some sections. The Mascot is a variety of high dessert quality which begins to ripen later than the Gandy. It is grown in New Jersey, Delaware, and Maryland. These three sorts should be tested in all sections where the Gandy and Sample are important varieties.

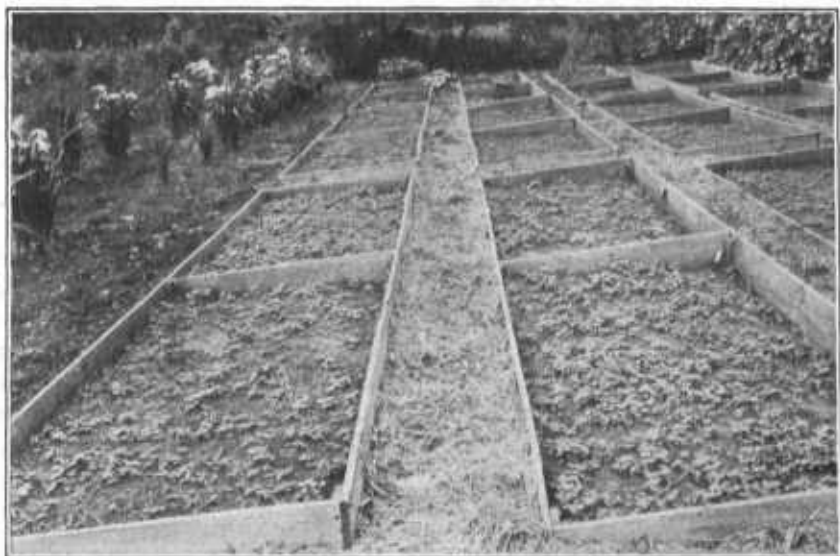


FIG. 7.—Seed beds filled with seedling strawberry plants. The seed was planted the previous autumn and the beds covered with a straw mulch, which was removed in early spring. On July 13, when the photograph was taken, about 15,000 seedlings had started, each one of which is potentially a distinct variety.

The Early Jersey, Premier, Burrill, Paul Jones, Hustler, and Columbia are other new sorts which have been widely tested and which seem to deserve further testing in regions where the Gandy is grown. The Lupton, although low in dessert quality, is very attractive in appearance and is worth testing.

THE RUNNING OUT OF VARIETIES.

It is often claimed in certain sections that a strawberry variety may be very productive for a few years, and then "run out," that is, become unproductive. Some sorts are said to run out quickly, in two or three years, others in about seven years, while the best run

out in about fourteen years. A glance at the record of the leading varieties grown at present should help to correct this view.

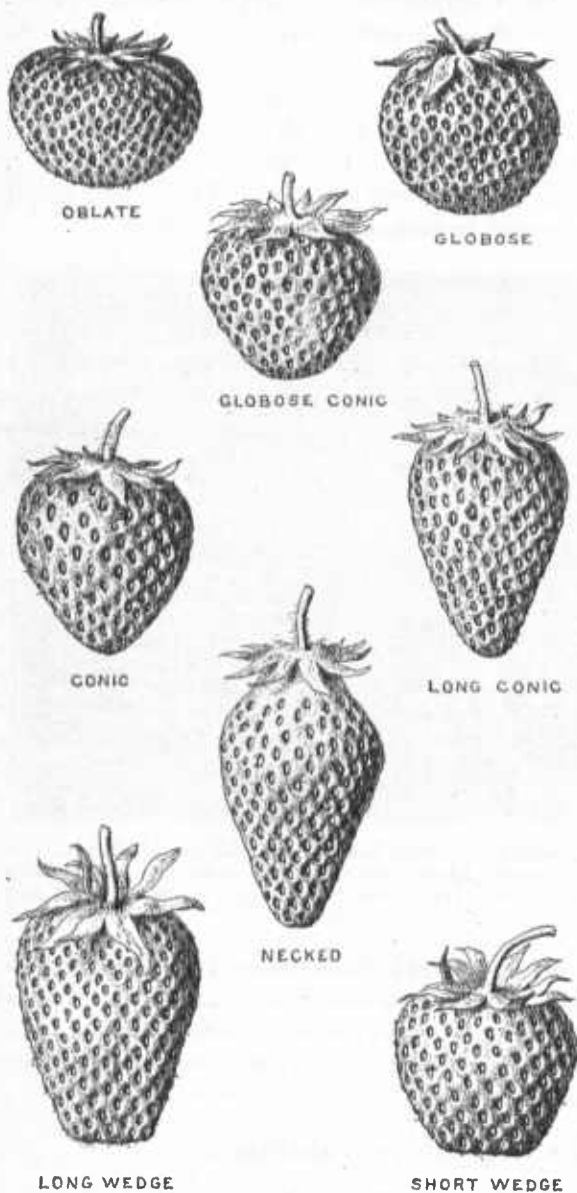


FIG. 8.—Different forms of strawberries, illustrating certain terms used in describing the varieties. (Drawn by L. C. C. Krieger.)

The Klondike was originated about 1896 and introduced in 1901, while the Aroma originated in 1889, the Dunlap in 1890, the Gandy in 1885, the Missionary about 1900, the Chesapeake in 1903, the Clark before 1880, the Joe before 1899, the Marshall in 1890, and the Sample in 1894. The Jueunda, the leading variety in Colorado, was introduced before 1860. The Wilson originated in 1851 and is still grown in some localities. It was at one time grown throughout the United States, but it has been replaced in most sections by varieties more resistant to disease and having larger, firmer berries with milder flavor. In the vicinity of Rochester, N. Y., where it is still grown to some extent for the canneries, it sometimes yields nearly 10,000 quarts to the acre, though in general its light yield is doubtless the

principal reason why it has been so largely crowded out by other varieties. Furthermore, the Wilson requires a richer soil than has

been used in many instances, which may account for the small crops produced. Since varieties having larger, firmer, and sweeter berries than the Wilson have been introduced the standards have risen and are continually rising. Unconsciously old sorts are being judged by new standards, and although they do not seem to be as good as they once were, in reality no change has occurred.

Where the yields of certain varieties have decreased markedly within a comparatively few years, various reasons may be assigned. In the South Atlantic, Gulf, and Pacific Coast States, the nematode has been an important cause of failure. In nearly all sections leaf-spots, Botrytis, and mildew have caused serious loss. New varieties may be comparatively free from these diseases at the time of their introduction, but after a few years may prove so susceptible that they can not be grown profitably. Therefore, although yields from certain sorts may decrease after a few years even on soils the fertility of which has been maintained, it is probable that some disease factor can be assigned as the cause of the reduced yield. In selecting varieties to plant, those resistant to disease should be chosen, and as far as possible they should be separated from diseased plantations. If the fertility of the soil is maintained, if varieties which are very resistant to disease are set, and if reasonable care is exercised in propagation, no running out in the usual sense of the term is likely to occur.

CHARACTERIZATIONS OF THE MORE IMPORTANT VARIETIES.

The following characterizations are intended to aid the prospective strawberry grower in his selection of sorts especially suited to his section and to the purpose for which he wishes to grow them. Only those varieties which are extensively grown in at least one section and promising new sorts which have been widely tested are listed here, and only those characteristics having a bearing on the commercial value of a variety are stated. By using these characterizations in connection with the list of varieties arranged according to States and sections in Table I, the prospective planter should be able to select desirable sorts for his conditions. The meaning of the terms used in describing the form of berries can be understood by reference to figure 8. Imperfect varieties have "*imp.*" following their names. All others are perfect.

Ablington.—Massachusetts origin, 1895. Berry medium to large, long-conic with blunt point to wedge shaped, soft, bright-red color with light-red to white flesh, subacid, quality good; midseason. Follage somewhat susceptible to leaf-spot in New England and southward; plants make runners freely. The Ablington has been grown extensively in the vicinity of Boston, and to some extent throughout New England. It is not as desirable as other varieties, because of the softness of the berry and the susceptibility of the follage to leaf-spot.

Arizona (*Arizona Everbearing*).—Arizona origin; introduced about 1890. Berry medium size, globose-conic, soft, light-red color with light-red flesh, mild subacid, quality good; midseason. Plants make few runners. The Arizona has been a leading variety in Arizona and in parts of the Pacific Southwest in hot sections where drought resistance is important, and it is still grown to some extent in Arizona and southern California.

Aroma.—Kansas origin, 1889. Berry large, globose-conic to short wedge shaped, firm, bright crimson on surface with light-red flesh, mild subacid, quality good; midseason to late. Foliage very healthy; plants make runners freely. The Aroma is the leading variety in Kentucky, northern Arkansas, and southern Missouri, and is grown extensively in Illinois, Indiana, Michigan, Ohio, West Virginia, and Delaware. Its chief merits are the disease resistance of its foliage, the productiveness of the plants, and the firmness, high dessert quality, and attractive appearance of the fruit. It is one of the best shipping varieties of the country and is well adapted to the general market requirements. It is best adapted to silt or clay soils.

Bederwood.—Illinois origin, 1881. Berry small to medium size, globose to globose-conic, soft to medium firm, crimson color with somewhat lighter colored flesh, brisk subacid, quality fair; season early. Foliage fairly healthy, and plants make runners freely. The Bederwood is very hardy and is grown at the present time in some parts of the northern Middle West and to a slight extent in western New York. Because the fruit is small, not very firm, and of poor color it has been discarded in most localities for other varieties. It is best adapted to heavy soils.

Belt (*William Belt*).—Ohio origin, about 1888. Berry large, irregular globose-conic to wedge shaped, soft, attractive dark crimson with dark-red flesh, mild subacid, quality very good to best; season medium late. Foliage only fairly healthy in New England, New York, and other parts of the North and very susceptible to leaf-spot diseases in New Jersey and southward; plants make runners freely. This variety is widely grown for home use and local market in New England and New York and to a slight extent in other northern regions. It is liked because of its productiveness and its attractive, dark-red, mild-flavored fruit of best quality. However, it should be planted on fertile soil and receive high cultivation. Fertilizers containing nitrogen should be applied, in order to insure an abundant foliage in the spring to mature the crop.

Brandywine.—Pennsylvania origin, 1889. Berries large, broadly globose-conic, medium firm, deep crimson with a dark flesh, brisk subacid, quality good to very good; season late. Foliage only fairly healthy in the extreme North, very susceptible to leaf-spot from the latitude of New Jersey southward; plants make runners very freely. This variety is still grown to a small extent in New England and Michigan under high culture, and it is one of the leading varieties about Los Angeles, Calif., where it fruits continuously from early spring until late autumn. In California it is not seriously affected by leaf-spot diseases, but in the Eastern States it is too susceptible to them to be desirable.

Bubach (*imp.*).—Illinois origin, 1882. Berry large, irregular in shape, rather soft, glossy bright-crimson color with red flesh, subacid, quality good; mid-season. Foliage fairly healthy; plants make few runners except on rich soil, but adapted to heavy soils. The Bubach has been grown extensively in the Middle West because of its productiveness and its large, attractive, red berries of good quality. The berries, however, are soft and somewhat irregular in shape, and the plants do not make sufficient runners. For these reasons the Bubach has been discarded in many sections in favor of better varieties.

Campbell.—New Jersey origin, about 1911. Berry medium size, globose to globose-conic, firm in southern New Jersey, rich crimson color with prominent yellow seeds, subacid, quality good; season very early and long. Foliage healthy; plants make runners freely. The Campbell is an early variety, the fruit of which resembles the Chesapeake very closely, although smaller. It is grown extensively in New Jersey, where it is liked for its productiveness and for its attractive fruit, which is uniform in shape and ships well.

Chesapeake.—Maryland origin, 1903. Berry large, globose-conic to short wedge shaped, firm, bright crimson, with prominent seeds and light-red or whitish flesh, mild subacid, quality good to very good; late in season. Foliage remarkably healthy; plants make few runners except in rich, moist soil. The Chesapeake is the leading variety grown under irrigation in the northeastern United States. It is also raised extensively without irrigation in Maryland, Delaware, and New Jersey, and is very desirable for home use and for market purposes in eastern Missouri and all the northern United States east of the Mississippi. It is liked because of its large, uniform, attractive fruit of excellent dessert and shipping quality and the remarkable freedom of its foliage from diseases and insects. Under irrigation it is one of the most productive of all varieties, and the fruit does not rot as badly as most other sorts.

Chipman.—Delaware origin, about 1901. Berry medium size, irregular long-conic to wedge shaped, soft to medium firm, crimson, mild subacid, quality good; season medium early and short. Foliage susceptible to leaf-spot; plants make runners freely. This variety is grown extensively only in that part of the Chesapeake Peninsula which is in the State of Virginia and is the leading variety there. In that locality, compared with the Klondike, it is far more productive, is slightly earlier, and the berries are liked much better by the buyers, who have paid 50 cents to \$1.50 more for each 32-quart crate of it than for the Klondike. The crop ripens in a short period of time, so that it does not compete much in the markets with localities farther north.

Clark.—Oregon origin, introduced about 1880. Berries medium size, globose to globose-conic, very firm in Oregon and Washington, dark crimson with dark-red flesh, brisk subacid to acid, quality good; midseason. Foliage healthy in the Northwest; plants make runners quite freely. The Clark is grown only in the Pacific Northwest and is practically the only variety raised in the Hood River and White Salmon regions. It is liked because of its excellent shipping quality and attractive color and because it retains its shape and color well when canned. It is considered the best shipping and canning sort grown in the Northwest, and is recommended for that region. It is not, however, a heavy producer.

Columbia (imp.).—Missouri origin, 1900. Berry large, globose to short wedge shaped, firm, attractive, dark crimson with red flesh, brisk subacid, quality good; season late. Foliage usually healthy; plants make runners moderately. This is a new variety grown by gardeners who wish very handsome fruit of good quality. It is adapted to conditions similar to those under which the Chesapeake succeeds. In some localities its foliage is not as healthy as that of the Chesapeake.

Dollar.—New Jersey origin; introduced about 1885. Berry large, globose-conic, firm in the Sacramento Valley of California, attractive red, subacid, quality good; season near Sacramento about three weeks after Jessie. Plants make runners freely. This is the leading variety near Sacramento, Calif., where it is liked because of its very firm fruit and attractive color, and because the plants bear steadily from about April 20 to late summer or autumn. It is not grown commercially elsewhere.

Dunlap.—Illinois origin, 1890. Berry medium size, conic, not very firm, dark crimson with deep-red flesh, subacid, quality very good; season early to mid-season. Foliage healthy in the North, somewhat susceptible to leaf-spot in the Southern States; plants make runners very freely; very hardy and drought resistant. This variety is grown almost exclusively in central and northern Illinois, in Wisconsin, Iowa, Minnesota, Nebraska, North Dakota, and South Dakota. It is also very widely grown in all other parts of the Northern States east of the Rocky Mountains. The Dunlap is liked because the plants are very hardy and productive, the foliage very healthy, and the berries of very good dessert quality. They are not, however, very good for shipping and are grown chiefly for home use and local markets.

Early Hathaway (*Texas*).—Arkansas origin, 1892. Berry medium size, globose-conic, scarlet with light-red to white flesh, moderately firm, brisk subacid, quality fair; season early. Foliage fairly healthy; plants make runners freely. This variety is grown to some extent in northern Alabama and in Kentucky and Maryland, but has been discarded generally, as it is not as dark red or as firm as some other sorts in those localities. It is, however, very productive.

Echo.—New York origin; introduced 1907. Berry medium size, globose-conic to short wedge shaped, firm, dull crimson with red flesh, subacid to acid, quality fair; midseason. Foliage affected somewhat by leaf-spot disease in eastern Massachusetts; plants make runners freely. The Echo is the leading variety in the Falmouth region of Massachusetts, where it is liked because of its productiveness, its large stiff stems which hold the fruit off the ground, and the shipping quality of the berries. It is not raised in other localities to any great extent.

Excelsior.—Arkansas origin, 1892. Berries small to medium, oboate to globose, firm, dark crimson with red flesh, acid, quality good; season very early. Foliage susceptible to leaf-spot diseases; plants make runners very freely. The Excelsior has been a leading early variety for market in all parts of the United States and is still grown extensively in Arkansas and southern California. It is liked because of its extreme earliness and because the fruit stands shipping well. The berries are very small, however, especially after the first two or three pickings. They are also very acid, hence, not desirable for dessert use until fully ripe, when they can not be shipped well.

Gandy.—New Jersey origin, 1885. Berry large, irregular, globose-conic, firm, deep crimson with red flesh, brisk subacid, quality good; season late. Foliage more healthy, as a rule, than that of most sorts, yet somewhat susceptible to mildew, and sometimes attacked by leaf-spot diseases; plants make runners freely. The Gandy is the leading variety in many parts of Maryland, Delaware, and New Jersey, and is extensively grown throughout the northern United States except in the colder parts of the Middle West. It is liked because of its large, attractive, deep-red, firm fruit, of excellent dessert quality, and because it ripens late, after the season of many others has ended. It is grown for shipping to the general markets and is liked for canning, especially in the home. It does best on moist heavy clay soils. Except on heavy soils, however, it is not very productive, and in some cases it is somewhat susceptible to foliage diseases. The berries are apt to decrease in size if a field is fruited more than one year.

Glen Mary (partially imperfect).—Pennsylvania origin; introduced in 1896. Berry large, irregular globose-conic, rather soft to medium, deep crimson with red flesh, often with white tips, subacid, quality good; midseason. Fruit stems too slender to hold fruit off the ground. Foliage susceptible to leaf-spot; plants make runners freely; best adapted to heavy soils. The Glen Mary is

grown extensively in New York and New England, and in some other parts of the northern United States. It is liked because it is exceedingly productive and the fruit is deep red in color. The plants, however, must receive high culture in order to produce berries of good size. The foliage is very susceptible to leaf-spot and for this reason it is grown very little south of New Jersey on the Atlantic coast. Even in the New England States and New York, growers consider it desirable to use large quantities of stable manure in late autumn or nitrate of soda in early spring in order to force a rapid spring growth of leaves; otherwise, the foliage may be so badly damaged by leaf-spot that not enough remains to mature a crop. The blossoms are not entirely self-fertile, and some other variety, such as the Dunlap, should be planted with it to furnish pollen. The berries often have white tips when they are otherwise ripe and ready to pick.

Gold Dollar.—Oregon origin; introduced about 1906. Berry medium to large, globose-conic, soft to fairly firm, dark crimson, flesh red to center, subacid, quality good; season early. Plants make runners freely. The Gold dollar is grown somewhat in Oregon, where it is considered one of the best early varieties.

Haverland (*imp.*).—Ohio origin, 1882. Berries medium to large, long-conic, soft, bright scarlet with light-red flesh, subacid, quality good; early to mid-season. Foliage healthy; plants make runners freely; adapted especially to heavy soils. The Haverland has been liked, especially in Ohio, Indiana, and Michigan, because of its productiveness, the attractiveness and good quality of its fruit, and its success on nearly all soils. The fruit, however, is soft and light colored and is not liked for any but near-by markets. The fruit stems are slender and the berries lie on the ground. It is not grown as much as formerly.

Jessie.—Wisconsin origin, 1880. Berry medium to large, globose-conic, only moderately firm, attractive, red with red flesh, subacid, quality good; mid-season, but about three weeks earlier than Dollar in the Sacramento region of California. The Jessie has been discarded by large berry growers in all parts of the United States except near Sacramento, Calif. Even there it is not liked as well as the Dollar and is being replaced by that variety and Marshall. It is reported in some localities as lacking in pollen, and under such conditions it should be treated as a pistillate sort. It needs rich soil and high culture.

Joe (*Big Joe*).—New Jersey origin; introduced in 1899. Berry large, globose-conic, firm, dark crimson with red flesh, subacid, quality good to very good; midseason to late. Foliage healthy; plants make runners freely on good soil. This variety is extensively grown in Maryland, New Jersey, and to some extent in Delaware. It is also grown to a less extent in all parts of the northern United States except in parts of the Middle West having very severe winters. It is liked because of its large attractive berries, which are very good shippers and of good dessert quality. The Joe is liked by many as well as the Chesapeake for intensive culture, and because it makes rather more plants than that variety it is sometimes more desirable.

Jucunda.—European origin; introduced before 1860. Berry large, globose-conic to long-conic, fairly firm, light crimson with white flesh, mild subacid to sweet, quality very good; season late. Plants make runners freely in Colorado. The Jucunda is practically the only variety grown in the Steamboat Springs region of Colorado, and is little grown elsewhere. It is liked there because of its high quality, attractive appearance, uniform shape, late season, and because the fruit stems hold the berries off the ground. The berry, however, is somewhat softer than is desirable for a first-class shipping variety, and the

flesh is too light in color. In the Steamboat Springs region it responds well to applications of stable manure, and the fruit ripens during the last of July and the first of August.

Klondike.—Louisiana origin, about 1896. Berry medium size, globose or globose-conic (except in California, where it is necked), very firm, deep crimson to center, acid, quality fair to good; midseason. Foliage healthy; plants make runners freely. The Klondike is grown almost exclusively in all parts of the South Atlantic and Gulf Coast States except in central Florida, in certain parts of North Carolina, and West Virginia, and in the Cullman region of Alabama. It is also grown extensively in southern California and in Arkansas, southern Missouri, southern Illinois, Maryland, and Delaware. It is liked because its foliage is very resistant to disease, and its fruit very firm and deep crimson in color. It is one of the best shipping varieties in the United States, and is especially adapted to market purposes. Because of its deep-red color and firm flesh, it is well liked for canning and is one of the best varieties for this purpose. The hulls, however, do not separate easily, and in Delaware and Maryland the berries are small after the first few pickings.

Late Stevens (*Stevens Late Champion*).—New Jersey origin, 1897. Berry large, irregular wedge shaped, firm, crimson color, brisk subacid, quality fair; season late. Foliage susceptible to mildew and somewhat susceptible to leaf-spots; plants make runners freely. The Late Stevens is grown to a considerable extent in New Jersey, Delaware, and New York for the general market, and to a small extent in other parts of the northern United States. Occasionally, where the fruit is uniform in shape and the plants are very productive, it is liked. In most sections, however, it is not as desirable for a late variety as the Gandy.

Lupton.—New Jersey origin; introduced about 1915. Berry large, often double; firm, very showy; quality poor; midseason. Foliage resembles the Chesapeake, but is quite susceptible to leaf-spot. Plants make runners freely. Best adapted to low ground like that on which the Gandy does best. The Lupton is being grown somewhat in southern New Jersey. It is liked because of its remarkably handsome fruit, which is considered to have good shipping quality; on the Philadelphia and Boston markets it has commanded fancy prices. The berries, however, have coarse, dry flesh which makes them low in dessert quality, and the foliage is susceptible to leaf-spot.

Magoon.—Oregon origin; introduced in 1894. Berry medium to large, irregular globose-conic, soft, attractive dark crimson with dark-red flesh, mild subacid, quality good; midseason. Makes plants freely. The Magoon is grown to some extent in the Willamette Valley of Oregon and in western Washington; it is very productive there, and is liked for home use and local market. The fruit, however, is too soft for shipping.

Marshall.—Massachusetts origin, 1890. Berry large, irregular globose-conic to conic, soft, deep crimson with dark-red flesh, subacid, quality best; early to midseason. Foliage fairly healthy in New England and New York, but too susceptible to leaf-spot farther south to be desirable; plants make runners freely; especially adapted to heavy soils. The Marshall is the standard of excellence in quality and is grown chiefly because of this and because, under the most intensive garden culture, it produces large crops of handsome berries. It seems necessary even in New England and New York to grow it on rich soil and to fertilize it heavily in the autumn with stable manure or in the spring with nitrate of soda in order to force a rapid growth of foliage; otherwise, the leaf-spot diseases frequently injure it so severely that the fruit does not develop. In southern New Jersey and regions of similar or more southern latitudes, the

Marshall is not considered desirable because it is very susceptible to leaf-spot, and because the berries are small after the first few pickings.

Mascot (*Doris*).—Virginia origin; introduced in 1908. Berry large, irregular globose-conic to short wedge shaped, medium red color with red flesh, firm, mild subacid, quality good; season late to very late. The Mascot has been widely tested in New Jersey, Delaware, and Maryland, and is now being grown extensively in some parts of those States. It is liked because it is later in season than the Gandy and is very productive, with very large attractive berries of excellent quality. In New Jersey it does not have the white or green tip, which often detracts from the appearance of the Gandy, and its quality is considered better. It is recommended for testing where the Gandy succeeds.

Minute Man (*imp.*).—Massachusetts origin, about 1895. Berry medium to large, globose-conic, light crimson with red flesh, subacid, quality good; season medium early. Makes rather few runners. This variety is grown extensively only in Massachusetts, chiefly near Fall River. Although introduced for some time it has not succeeded in other localities and therefore is not recommended for general planting.

Missionary.—Virginia origin, about 1900. Berry below medium size to large, conic, soft to very firm according to the section in which it is grown, dark crimson with dark-red flesh, acid, quality fair to good; early to midseason. Foliage very resistant to leaf-spot; makes runners freely. This variety is the standard sort for central Florida and is grown extensively in the eastern part of North Carolina, in the Norfolk region of Virginia, and in some parts of eastern Maryland. The berry, however, is softer than the Klondike in North Carolina, Virginia, and Maryland, is not considered as desirable, and is being supplanted to some extent by the Klondike and other early sorts. In central Florida the berry is very firm, and excellent for shipping. It begins to ripen there in December or January and continues until April at least. Because of its ripening season, its firm, attractive fruit, and the freedom of its foliage from leaf-spots, it is considered more desirable than any other sort for that region.

Myer (*imp.*).—Delaware origin, 1906. Berry medium size to large, globose-conic, soft to medium firm, attractive deep-red color with lighter flesh, mild subacid, quality good; midseason to late. Foliage healthy; plants make runners freely. This variety is grown extensively only in southern Delaware, where it is liked because of its productiveness and because its fruit is of good size, attractive in color, and reaches market in fair condition. In addition, the Myer, being a pistillate variety, is not affected as much by the weevil as many other varieties and is liked because of this. It is not as good for shipping, however, as other varieties grown in that region.

New York.—New York origin, 1890. Berries large to very large, irregular, crimson with red flesh, soft to firm, mild subacid, quality very good; midseason. Foliage healthy in the Northeast; plants make runners freely. This variety has been widely grown in the Northeastern States because of its large sweet fruit, which can be eaten by many who can not eat the more acid fruit of most sorts. The New York is sold under other names, though there may be other varieties sold under the same names. There are several varieties in the trade which are very similar to, and probably some of them are identical with the New York. These include the Otto, Fairdale Giant, Morgan, Oswego, Pocahontas, Roosevelt, Ryckman, Maximus, Big Berry, Armstrong, Hummer, Uncle Jim, and others.

Nich Ohmer.—Ohio origin; introduced in 1898. Berry large to very large, globose-conic, firm, attractive deep crimson with glossy surface and lighter

red flesh, mild subacid, flat without quality in some localities and in others, including the Pacific Coast, its quality is good to very good; midseason to late. Foliage somewhat susceptible to leaf-spot in the eastern United States; plants make runners fairly freely. Nich Ohmer is grown to a small extent in central Florida and in other parts of the eastern United States and quite extensively in the Watsonville region of California, where it is considered one of the most desirable varieties because of its productiveness and its large, firm, and very attractive fruit of very good dessert quality. In the eastern United States it is not liked because the fruit is often of poor quality, and after the first few pickings the berries are small in size.

Oregon.—Oregon origin, about 1898. Berry medium to large, globose-conic to conic, fairly firm, dark crimson with lighter red flesh, mild subacid, quality good to very good; early to midseason. Plants make runners freely. The Oregon is grown chiefly in the Pacific Northwest and in the vicinity of San Francisco, Calif.; it is considered desirable for home use and for markets because of the productiveness of the plants and its large attractive berries of excellent quality.

Parsons (*Parsons Beauty*).—Maryland origin, about 1890. Berry medium to large, irregular-conic to wedge shaped, soft, bright crimson with red flesh, brisk subacid, quality fair to good, midseason. Foliage somewhat susceptible to leaf-spot; plants make runners freely. This variety is grown chiefly for canneries, and is liked very well for this purpose. The plants are productive; the fruit retains its shape fairly well after cooking; the hull removes easily; and the flesh is red and has a brisk subacid flavor. The Parsons is grown chiefly in Delaware, Maryland, and western New York. It is usually advantageous to use stable manure in late autumn on plantations of this variety in order to induce a vigorous foliage growth in early spring.

Pocomoke (*Gibson*).—Maryland origin; introduced about 1902. Berry medium to large, globose-conic, fairly firm, bright crimson, brisk subacid, quality good; midseason. Foliage fairly healthy; plants make runners freely. This variety is grown extensively in western New York, Michigan, and other parts of the Middle West. It is also grown extensively under the name Gibson. It is liked because it is hardy and productive, with large attractive fruit which reaches the market in good condition.

Progressive.—Iowa origin, 1908. Berry small to medium size, conic, soft to moderately firm, dark crimson with dark-red flesh, subacid, quality good to very good; an everbearer, season early, fruiting until hard frosts in autumn. Foliage healthy and one of the most resistant of all to leaf-spot diseases; plants make runners freely on rich ground. The Progressive is the most widely grown of the everbearing strawberries. It is liked because of its hardiness, its resistance to leaf-spot diseases, its excellent dark-red fruit; also because if planted in early spring it yields a considerable quantity of fruit the same year. It is especially adapted to home gardens and intensive culture on rich soil, amply supplied with moisture. It is adapted to regions north of those in which the Klondike succeeds, but has not been found adapted to the South.

Rice (*imp.*) (*Kittie Rice, Downing's Bride*).—Ohio origin, about 1890. Berry large, globose-conic, dark crimson with red flesh, subacid, quality good; early midseason. Foliage susceptible to leaf-spots; plants make runners freely on rich soil. This variety is grown principally in Massachusetts, and although it has been in the trade for many years it does not seem to have proved as desirable as other varieties in most regions.

Sample (*imp.*).—Massachusetts origin, 1894. Berry large, conic to long-conic, soft to medium firm, dark crimson with red flesh, subacid, quality good; season

late. Foliage usually healthy in the North, affected by leaf-spot in southern New Jersey and southward; plants make runners freely. The Sample is grown extensively in New England and New York and to some extent in Pennsylvania, Ohio, Michigan, Indiana, and Illinois. It is liked because of its productiveness and its large, uniform, attractive, dark-red fruit. The berries, however, are somewhat soft for shipping; it is especially adapted to home gardens and the local market. It is commonly pollinated with Duniap and other varieties of the same season.

Shropshire.—New Jersey origin, about 1911. Berries medium to large, irregular, conic wedge shaped, many berries hollow, firm, dark crimson with red flesh, subacid, quality poor to fair; midseason. Foliage healthy; plants make runners freely. This variety is grown quite extensively in southern New Jersey, but has not been tried in other localities. It is liked because of its productiveness, its very showy berries with their prominent seeds, and its large stems, which hold the fruit erect. The fruit, however, is of poor quality.

Superb.—New York origin, 1908. Berry medium to large, globose to globose-conic, light scarlet until fully ripe, when it becomes dark crimson with lighter-colored flesh, rather soft to firm, mild subacid becoming insipid in cool weather; quality good to poor; an everbearer, the first picking being in midseason. Foliage very healthy; plants under some conditions make runners freely; under other conditions they make few new plants. The Superb, next to the Progressive, is the most widely grown of the everbearing sorts and is liked because of its hardiness, its healthy foliage, its handsome, mild-flavored fruit, and its everbearing characteristics. It is especially adapted to soils low in nitrogen and having an ample moisture supply, both in the Northeast and in the irrigated parts of the Northwest.

Success.—Connecticut origin; introduced in 1897. Berry medium to large, irregular globose-conic, soft, bright scarlet with light-red flesh, mild subacid, quality good to very good; early to midseason; makes runners freely. This variety is grown to some extent in New Jersey and New England and is liked because of its attractive fruit of excellent quality. It is adapted to home use and local markets in the northern part of the United States.

Superior.—Delaware origin, about 1888. Berry medium size, conic wedge shaped, firm, dark crimson with light-red to whitish flesh, subacid to acid, quality good; season medium early. Makes runners freely. This variety is liked in some parts of Delaware and New Jersey because of its productiveness and its very attractive fruit with prominent seeds. It is also a fairly good shipping variety and is used by canneries. The berries, however, are small after the first few pickings, and it is now being supplanted by other varieties in many localities.

Tennessee (*Tennessee Prolific*).—Tennessee origin; introduced about 1892. Berry medium size to large, globose-conic to wedge shaped, soft to moderately firm, bright crimson with red flesh, subacid, quality good; season early. Foliage healthy near Washington, D. C.; plants make runners freely. This variety has been discarded in most sections except in the vicinity of Washington, D. C., where it is the leading sort. It is liked because of its productiveness and the attractiveness of its fruit. The berries, however, are rather soft for distant shipment.

Thompson (*Lady Thompson*).—North Carolina origin, prior to 1891. Berry medium sized, globose to globose-conic, soft to fairly firm, light scarlet with light-red flesh, subacid, quality good; early to midseason. Foliage fairly healthy; plants make runners freely. This variety has been grown extensively in the southeastern United States, but has been largely supplanted by the Klondike. It is

very productive but the berries are too soft and too light in color for a good market sort.

Warfield (*imp.*).—Illinois origin, about 1882. Berry small to medium size, globose to conic, glossy, soft to fairly firm, dark crimson with dark-red flesh, acid, quality good; early to midseason. Foliage quite healthy; plants make runners very freely. It has been one of the leading varieties in the northern United States, but has been discarded except in some parts of Wisconsin, Minnesota, and other parts of the Middle West which have severe winters. It is liked because of its productiveness and because the plants are among the hardiest, enduring the extreme climate of the northern part of the Middle West better than most varieties. The fruit is one of the best for canning, retaining its color, shape, and flavor well. However, it is always rather small and may be very small at the end of the season; Therefore, it should be grown on rich soils. The Dunlap is commonly used to pollinate it.

Williams.—Canada origin; introduced in 1890. Berry medium to large, globose-conic to short wedge shaped, fairly firm, dark crimson with red flesh, often with white tips, subacid, quality fair to good; midseason. Foliage somewhat susceptible to leaf-spot diseases; plants make runners freely. In the United States this variety is grown chiefly in western New York and is liked there because of its productiveness and its dark-red fruit. The plants, however, are susceptible to diseases, and the berries often have white tips and are not as attractive or as good in quality as many others.

Wilson.—New York origin, 1851. Berry medium size, globose-conic, soft to firm, dark crimson, with dark-red flesh, brisk subacid flavor, quality good; medium early. Foliage fairly healthy in New York; plants make runners freely. The Wilson was formerly grown extensively in nearly all parts of the United States, but is now planted very little except in western New York, near Rochester, and in the States of Oregon and Washington. It is liked because of its extreme productiveness on fertile soils and its dark-red acid fruit of good quality, which is used almost entirely for canning. It should be grown on fertile soils containing a good supply of nitrogen, which will force a vigorous growth of the foliage.

Woolverton.—Canada origin; introduced in 1891. Berry large, globose-conic to wedge shaped, soft to moderately firm, crimson with red flesh, mild subacid, quality good; midseason. Makes runners freely. This variety is grown very little except in Delaware, where it is used to pollinate the Myer. These varieties are somewhat similar in appearance and can be shipped together. Because the Woolverton is rather soft it is not so well adapted to commercial use as some other varieties.